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EXAMINER	
PHU, SANH D	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/762,153	CHEN ET AL.	
	Examiner	Art Unit	
	/Sanh D. Phu/	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 February 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-13,15-21,23-32,34-43,45-52,54,56 and 58-61* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-13,17-21,23-32,34-43,45-52,54,56,58-61* is/are rejected.

7)☒ Claim(s) *15 and 16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is responsive to the Amendment filed on 2/21/08. Accordingly, claims 1, 2, 4-13, 15-21, 23-32, 34-43, 45-52, 54, 56, 58-61 are currently pending; and claims 3, 14, 22, 33, 44, 53, 55 and 57 are canceled.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 2, 4, 11, 12, 13, 17-21, 23, 30-32, 34, 41-43, 45, 52, 54, 56, 58-61 are rejected under 35 U.S.C. 102(e) as being anticipated by Jones et al (2004/0213146), newly-cited.

-Regarding claim 1, Jones et al discloses a transceiver (see figures 2 and 11) comprising:

a receiver (e.g., comprising (220) (see figure 2)) to receive and provide an analog communication signal at input (1120) from channel (RX1) (see figure 11), the analog communication signal containing an interference signal (comprising echo coupled from (Tx1) and crosstalks coupled from (Tx2, Tx3, Tx3) (see [0052-0055, 0118, 0121]);

a digital compensation circuit (comprising (1104)) (see figure 11) to generate a digital replica (1116) of the interference signal contained in the analog communication signal (see [0119, 0121]);

a converter (comprising (1138)) (see figure 11) to convert the digital replica of the interference signal into a corresponding analog replica of the interference signal (see [0121]); and

a subtraction circuit (1124) (see figure 11) to subtract the analog replica of the interference signal from the analog communication signal (see [0121]),

wherein the digital compensation circuit includes a near-end crosstalk (NEXT) canceller (comprising (1104)) to generate a signal (1116) comprising a

digital replica of at least one NEXT interference signal in the analog communication signal (see [0052-0055, 0118, 0121]).

-Regarding claim 2, Jones et al discloses that the digital compensation circuit includes an echo canceller (comprising (1104)) to generate a signal (1116) comprising a digital replica of an echo interference signal, coupled from (TX1), in the analog communication signal (see figure 11).

-Regarding claim 4, Jones et al discloses an analog- to-digital converter (ADC) (1154) to sample the analog communication signal having the analog replica subtracted therefrom, and generate a digital signal that is substantially devoid of the interference signal (see figure 11, [0127]).

-Regarding claim 11, Jones et al discloses that the transceiver is IEEE 1000Base-TX complaint (see [0003]).

-Regarding claim 12, as similarly applied to claims 1, 2, 4 and 11 set forth above and herein incorporated, Jones et al discloses a method (see figure 11) for reducing interference signals in an analog communication signal received at input (1120) from channel (RX1), the method comprising:

procedure (1124) of receiving the analog communication signal through a receiver, the analog communication signal containing an interference signal (comprising echo coupled from (Tx1) and crosstalks coupled from (Tx2, Tx3, Tx3));

procedure (comprising (1104)) of generating a digital replica (1116) of the interference signal contained in the analog communication signal;

procedure (1138) of converting the digital replica of the interference signal into a corresponding analog replica of the interference signal; and

procedure (1124) subtracting the analog replica of the interference signal from the analog communication signal to substantially cancel the interference signal from the analog communication signal wherein the interference signal includes at least one NEXT interference signal.

-Claim 13 is rejected with similar reasons set forth for claim 2.

-Claim 17 is rejected with similar reasons set forth for claim 4.

-Regarding claim 18, as applied to claims 13, Jones et al discloses that generating a digital replica of the interference signal includes generating a digital echo interference signal, (considered here equivalent with the limitation "a digital replica of a portion of the interference signal").

-Regarding claim 19, in Jones et al, the echo interference signal, as a signal, inherently has voltage level(s), (considered here equivalent with the limitation "high voltage portions").

-Regarding claim 20, as similarly applied to claims 1, 2, 4, 11-13, 17, 18 and 19 set forth above and herein incorporated, Jones et al discloses a transceiver (see figures 2 and 11) comprising:

receiving means (e.g., comprising (220) (see figure 2)) for receiving and providing an analog communication signal at input (1120) from channel (RX1) (see figure 11), the analog communication signal containing an interference signal (comprising echo coupled from (Tx1) and crosstalks coupled from (Tx2, Tx3, Tx3);

generating means (comprising (1104) (see figure 11)) for generating a digital replica (1116) of the interference signal contained in the analog communication signal ;

converting means (1138) (see figure 11) for converting the digital replica of the interference signal into a corresponding analog replica of the interference signal; and

subtracting means (1124) (see figure 11) for subtracting the analog replica of the interference signal from the analog communication signal to substantially cancel the interference signal from the analog communication signal,

wherein the generating means includes means (1104) for generating a digital replica of at least one NEXT interference signal in the analog communication signal.

-Claim 21 is rejected with similar reasons set forth for claim 2.

-Claim 23 is rejected with similar reasons set forth for claim 4.

-Claim 30 is rejected with similar reasons set forth for claim 11.

-Regarding claim 31, similarly applied to claims 1, 2, 4, 11-13, 17, 18 and 19 set forth above and herein incorporated, Jones et al discloses a network device (see figures 2 and 11) in a communication system, the network device comprising: a transceiver operable to receive an analog communication signal containing an interference signal, the transceiver including:

a receiver (e.g., comprising (220) (see figure 2)) to receive and provide an analog communication signal at input (1120) from channel (RX1) (see figure 11), the analog communication signal containing an interference signal (comprising echo coupled from (Tx1) and crosstalks coupled from (Tx2, Tx3, Tx3);

a digital compensation circuit (comprising (1104) (se figure 11)) to generate a digital replica (1116) of the interference signal contained in the analog communication signal;

a converter (1138) (see figure 11) to convert the digital replica of the interference signal into a corresponding analog replica of the interference signal; and

a subtraction circuit (comprising (1124)) (see figure 11) to subtract the analog replica of the interference signal from the analog communication signal,

wherein the digital compensation circuit includes a NEXT canceller (1124) to generate a digital replica of a NEXT interference signal in the analog communication signal.

-Claim 32 is rejected with similar reasons set forth for claim 2.

-Claim 34 is rejected with similar reasons set forth for claim 4.

-Claim 41 is rejected with similar reasons set forth for claim 11.

-Regarding claim 42, similarly applied to claims 1, 2, 4, 11-13, 17, 18 and 19 set forth above and herein incorporated, Jones et al discloses a network device (see figures 2 and 11) in a communication system, the network device

comprising: communication means for receiving an analog communication signal containing an interference signal, the communication means including:

receiving means (e.g., comprising (220) (see figure 2)) to receive and provide an analog communication signal at input (1120) from channel (RX1) (see figure 11), the analog communication signal containing an interference signal (comprising echo coupled from (Tx1) and crosstalks coupled from (Tx2, Tx3, Tx3);

generating means (comprising (1104) (see figure 11)) for generating a digital replica (1116) of the interference signal contained in the analog communication signal;

converting means (1138) (see figure 11) for converting the digital replica of the interference signal into a corresponding analog replica of the interference signal; and

subtracting means (1124) (see figure 11) for subtracting the analog replica of the interference signal from the analog communication signal to

substantially cancel the interference signal from the analog communication signal,

wherein the generating means includes means (1104) for generating a digital replica of at least one NEXT interference signal in the analog communication signal.

-Claim 43 is rejected with similar reasons set forth for claim 2.

-Claim 45 is rejected with similar reasons set forth for claim 4.

-Claim 52 is rejected with similar reasons set forth for claim 11.

-Regarding claim 54, similarly applied to claims 1, 2, 4, 11-13, 17, 18 and 19 set forth above and herein incorporated, Jones et al discloses a cancellation system (see figures 2 and 11) for use in a communication system including a communication line (e.g., line (216) (see figure 2)), the communication line having a transmitter and a receiver at each end, the cancellation system to reduce interference signals in an analog communication

signal received by a receiver (e.g., comprising (220) (see figure 2)), the cancellation system (see figure 11) comprising:

a NEXT canceller (comprising (1104) (see figure 11)) associated with the receiver, the NEXT canceller to receive a transmitted signal from a local transmitter (Tx1,...,txN)), the NEXT canceller operable to generate a digital replica NEXT interference signal (1116) based on the transmitted signal;

a converter (1138) (see figure 11) to convert the digital replica of the NEXT interference signal into a corresponding analog replica of the NEXT interference signal; and

a subtracter (1124) (see figure 11) to subtract the replica NEXT interference signal from an analog communication signal received by the receiver.

-Regarding claim 56, similarly applied to claims 1, 2, 4, 11-13, 17, 18, 19 and 54 set forth above and herein incorporated, Jones et al discloses a cancellation system (see figures 2 and 11) for use in a communication system

including a communication line, the communication line (e.g., line (216) (see figure 2)) having a transmitter and a receiver at each end, the cancellation system to reduce interference signals in an analog communication signal received by a receiver receiver (e.g., comprising (220) (see figure 2)), the cancellation system comprising:

NEXT cancellation means (comprising (1104) (see figure 11)) associated with the receiver, the NEXT cancellation means to receive a transmitted signal from a local transmitter (Tx1,...,txN)), the NEXT cancellation means for generating a digital replica NEXT interference signal (1116) based on the transmitted signal;

converting means (1138) for converting the digital replica of the NEXT interference signal into a corresponding analog replica of the NEXT interference signal; and

subtracting means (1124) for subtracting the replica NEXT interference signal from an analog communication signal received.

-Regarding claim 58, similarly applied to claims 1, 2, 4, 11-13, 17, 18, 19 and 54 set forth above and herein incorporated, Jones et al discloses a method for reducing interference signals in an analog communication signal received by a receiver of a communication line, the method (see figure 11) comprising:

procedure (1124) of receiving a transmitted signal from a transmitter (Tx1) local to a receiver;

procedure (comprising (1104)) of generating a digital replica NEXT interference signal (1116) based on the transmitted signal;

procedure (1138) of converting the digital replica of the NEXT interference signal into a corresponding analog replica of the NEXT interference signal; and

procedure (1124) subtracting the replica NEXT interference signal from an analog communication signal received by the receiver.

-Regarding claim 59, similarly applied to claims 1, 2, 4, 11-13, 17, 18, 19 and 54 set forth above and herein incorporated, Jones et al discloses a transceiver (see figures 2, 9 and 11) comprising:

a receiver (e.g., comprising (220) (see figure 2)) to receive an analog communication signal, the analog communication signal containing a plurality of interference signals with at least one interference signal being generated by a non-local signal source (Tx2,..,txN) (see figure 11);

a digital compensation circuit (comprising (1104) (see figure 11)) to generate a digital replica (outputted from (704A) (see figure 9)) of each interference signal contained in the analog communication signal (see [0097, 0098, 0119]);

a combiner (708A) (see figure 9) to combine each digital replica to generate a combined digital replica (see figure 9);

a converter (1138) (see figure 11) to convert the combined digital replica into a corresponding analog replica of the interference signal; and

a subtraction circuit(1124) (see figure 11) to subtract the analog replica from the analog communication signal.

-Regarding claim 60, similarly applied to claims 1, 2, 4, 11-13, 17, 18, 19, 54, 59 set forth above and herein incorporated, Jones et al discloses a method (see figures 2, 9 and 11) for reducing interference signals in an analog communication signal, the method comprising:

procedure (1124) (see figure 11) of receiving an analog communication signal at an input (1120) on a channel line RX1 through a receiver (e.g., comprising (220) (see figure 2)), the analog communication signal containing a plurality of interference signals with at least one interference signal being generated by a non-local signal source (Tx2,...,TxN) (see figure 11);

procedure (704A) (see figure 9)) generating a digital replica of each interference signal contained in the analog communication signal;

procedure (708A) (see figure 9) of combining the digital replica of each interference signal to generate a combined digital replica;

procedure (1138) (see figure 11) of converting the combined digital replica (1116) into a corresponding analog replica of the interference signal; and

procedure (1124) of subtracting the analog replica from the analog communication signal to substantially cancel each interference signal from the analog communication signal.

-Regarding claim 61, similarly applied to claims 1, 2, 4, 11-13, 17, 18, 19, 54, 59 set forth above and herein incorporated, Jones et al discloses a network device (see figures 2, 9 and 11) in a communication system, the network device comprising: a transceiver operable to receive an analog communication signal containing a plurality of interference signals with at least one interference signal being generated by a non-local signal source, the transceiver including:

a receiver (e.g., comprising (220) (see figure 2)) to receive and provide the analog communication signal at input (1120) on a channel line (Rx1) (see figure 11);

a digital compensation circuit (comprising (1104) (see figure 11)) to generate a digital replica (outputted from (704A) (see figure 9)) of each interference signal contained in the analog communication signal;

a combiner (708A) (see figure 9) to combine the digital replica of each interference signal to generate a combined digital replica;

a converter (comprising (1138)) (see figure 11) to convert the combined digital replica (1116) into a corresponding analog replica of the interference signal; and

a subtraction circuit (1124) (see figure 11) to subtract the analog replica of the interference signal from the analog communication signal.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 5, 24, 35 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al in view of Druihe (6,452,967), previously-cited.

-Regarding claim 5, and similarly applied to claims 24, 35, 46, Jones et al does not teach a FIFO buffer to receive the digital signal and store the digital signal on a first-in-first-out basis.

Druihe teaches a phase locked loop (PLL) for providing a clock signal (CLK) for an ADC (A/D CONVERTER) and a FIFO buffer (MM) to receive the digital signal and store and retrieve the digital signal output of the ADC on a first-in-first-out basis in order to absorb the jitter of the phase locked loop (see figure 2, and col. 8, lines 56-63).

Since in Jones et al, a clock signal is inherently needed in the ADC (1154) (see figure 11) for sampling the analog communication signal, and Jones et al does not teach how the clock signal of the ADC is provided, it would have been obvious for a person skilled in the art to additionally implement Jones et al with a phase locked loop and a FIFO buffer, as taught by Druihe, in such a way that the phase locked loop would provide the clock signal for the ADC, and the

FIFO would be inserted after (1154) (see Jones et al, figure 11) to receive and retrieve the digital signal on a first-in-first-out basis for further processing so that with such the implementation, the clock signal would be provided as required and the digital signal of the ADC outputted from the FIFO buffer would be free of jitter and ready for further processing.

6. Claims 6-10, 25-29, 36-40, 47-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al in view of Druihe and further in view of Roo (6,775,529), previously cited.

-Regarding claim 6, and similarly applied to claims 25, 36, 47, Jones et al in view of Druihe does not teach a feed forward equalizer (FFE) to receive the digital signals from the FIFO buffer, the FFE operable to filter individual digital signals, as claimed.

Roo teaches using a FFE (16) to remove intersymbol interference from a received digital signal (see figure 4, col. 6, lines 15-19).

It would have been obvious for a person skilled in the art to additionally implement Jones et al invention in view of Druihe with a FFE, as taught by Roo, in such a way that the FFE would be inserted after (1128) (see Jones et al, figure

11) to filter individual digital signals in order to remove possible intersymbol interference from the digital signals outputted from the FIFO buffer so that the digital signals would be free of possible intersymbol interference for further processing.

-Regarding to claim 7, and similarly applied to claims 26, 37, 48, Jones et al in view of Druihe and Roo does not teach that the FFE is LMS type adaptive filter. However, Jones et al in view of Druihe and Roo teach that the FFE is a finite impulse response (FIR) equalizer (see Roo, col. 5, lines 2-7). On the other hand, implementing a FIR equalizer as a LMS type adaptive filter is well-known in the art, and the examiner takes Official Notice. Since Jones et al in view of Druihe and Roo does not teach in detail how the FFE is implemented, it would have been obvious for a person skilled in the art to implement the FFE as a LMS type adaptive filter so that the FFE would be provided as required.

-Regarding to claim 8, and similarly applied to claims 27, 38, 49, Jones et al in view of Druihe and Roo teaches that the invention is configurable to further comprise a data detector to detect data from the filtered individual digital signals (see Roo, (18) of figure 4).

-Regarding to claim 9, and similarly applied to claims 28, 39, 50, Jones et al in view of Druihe and Roo teaches that the data detector is a Viterbi detector detector to detect data from the filtered individual digital signals.

-Regarding to claim 10, and similarly applied to claims 29, 40, 51, in Jones et al in view of Druihe and Roo, inherently the data is an electrical data symbol (see Roo, (PSC) of figure 4).

Allowable Subject Matter

7. Claims 15 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

8. Applicant's arguments filed on 1/20/04 have been fully considered. As results, the claim rejections written in the previous Office Action have been withdrawn, and claims 15 and 16 are indicated allowable set forth above. Claims 1, 2, 4-13, 17-21, 23-32, 34-43, 45-52, 54, 56 and 58-61, however, are deemed not allowable because of reasons set forth above in this Office Action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to /Sanh D. Phu/ whose telephone number is (571)272-7857. The examiner can normally be reached on M-Fr from 8:00-16:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nay Maung can be reached on (571) 272-7882. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sanh D Phu/
Primary Examiner
Art Unit 2618

SP